

in.; Sandusky, Ohio, 2.42 in.; Toledo, Ohio, (19th and 20th,) 3.52 in.; 20th, Fort Porter, N. Y., 2.14 in.; 21st, Norfolk, Va., 2.27 in.; Omaha, Neb., 2.14 in.; Cape Henry, Va., 2.28 in.; 22d, Wood's Holl, Mass., 2.63 in.; 25th, New Orleans, La., 2.53 in.; Mt. Sterling, Ill., 2.20 in.; Galveston, Texas, (24th and 25th,) 9.43 in.; Baton Rouge Barracks, La., 2.50 in.; 26th, Norfolk, Va., 1.97 in.; Smithville, N. C., 2.20 in.; 29th, Vicksburg, Miss., 1.94 in.; Baton Rouge Barracks, La., 2.60 in.; 30th, New Orleans, La., 3.52 in.; Indianola, Texas, 3.24 in.; Galveston, Texas, 2.12 in.; most of the smaller rain-falls here noted fell in the course of a few hours.

Large Monthly Rain-falls.—The following stations report large monthly rain-falls: Galveston, 17.39 inches; Alpena, 13.18 in.; Indianola, 11.75 in.; Denison, 10.74 in.; New Haven, 10.09 in.; Pilot Point, 10.42 in.; St. Marks, 10.61 in.; Baton Rouge, 16.75 in.; Quitman, Ga., 18.03 in.; Auburn, N. H., 18.15 in.; White Plains, N. Y., 18.09 in.; Pelham, N. Y., 10.43 in.

Small Monthly Rain-falls.—The following stations report little or no rain during the month: Camp Verle, 0.43 inches; Eagle Pass, 0.35 in.; Edinburg, 0.32 in.; Florence, 0.49 in.; Phoenix, none; Stanwix, none; Tucson, 0.46 in.; Winnemucca, 0.02 in.; Wickenburg, none; Yuma, none; Alcatraz Island, 0.40 in.; Salinas City, 0.12 in.

Droughts.—The distribution of rain, as given on the accompanying chart, shows slight deficiencies of rain to have occurred in the Ohio and St. Lawrence valleys; but no special reports of droughts, as affecting vegetation, have been received, except such notes as are referred to in the chapter on the height of water in rivers.

Floods.—Destructive floods attended the heavy rains, of the first four days of the month, in the East Gulf and Atlantic states, but in general, the excess of rain has served only to keep the streams very high and promote vegetation up to the last days of autumn.

Hail occurred on the 3rd, in Iowa, Mo.; 5th, Neb., N. Y.; 14th N. C.; 20th, Ky., Mo.; 22nd, Me., Mass.; 25th, Me., Tex., 26th, Neb., N. Y.

Snow.—Snow-falls during the month occurred as follows: on the 2nd, Dak.; 4th, Pa.; 5th, Wy. Ty., Wis.; 6th, N. Y., Pa., Wy. Ty., Vt.; 8th, Mich.; 10th, Ind.; 11th, Col.; 12th, Col., Wy. Ty.; 13th, Col., Wy. Ty.; 14th, Dak., Neb., Wy. Ty.; 15th, Wy. Ty., Neb.; 18th, Col., Neb., Wy. Ty.; 19th, Col., Neb., Wy. Ty.; 20th, Wy. Ty.; 21st, Me.; 22nd, Me., Mass., N. H., N. Y., Ohio, R. I.; 23rd, Pa.; 25th, Me., N. Y.; 28th, Me., Wy. Ty.; 27th, Col., Neb.; 28th, Col., Neb., Utah, Wy. Ty.; 29th, Col., Wy. Ty.; 30th, Col., Minn., Wy. Ty.; 31st, Col., Neb., Wy. Ty. At the end of the month snow was one to three inches deep in Utah and Nevada, and four inches deep in Vermont. Two feet of snow had fallen on Pike's Peak at the end of the month, where winter had set in unusually early.

Rainy Days.—The number of days on which rain has fallen as recorded by Signal Service observers ranges as follows: For New England, 15 to 18; Middle Atlantic States, 11 to 18; Lower Lake region, 15 to 19; Tennessee and the Ohio valley, 10 to 15; South Atlantic and East Gulf States, 9 to 15; West Gulf coast, 12 to 18; Upper Mississippi and Lower Missouri valleys, 5 to 13.

Cloudy Days.—The number of cloudy days is reported by volunteer observers as follows: New England, 5 to 14; Middle States, 13 to 19; South Atlantic States, 6 to 10; East Gulf States, 8 to 20; West Gulf States, 12 to 15; Tennessee and the Ohio valley, 6 to 10; Lower Lakes, 10 to 12; Upper Lake region, 13 to 18; the Northwest, 10 to 20.

RELATIVE HUMIDITY.

The average relative humidity for the month ranges about as follows: For New England, 71 to 78; Middle Atlantic States, 70 to 76; South Atlantic States, 63 to 79; East Gulf States, 72 to 79; West Gulf coast, 73 to 81; Western Texas, 54 to 75; Tennessee and the Ohio valley, 65 to 72; Lower Lakes, 68 to 79; Upper Lakes, 69 to 82; Upper Mississippi valley, 70 to 75; Lower Missouri valley, 70 to 74; the California coast, 71 to 74; the Sacramento valley, 42 to 49. High stations report the following average percentages, not corrected for altitude: Cheyenne, 61; Denver, 50; Mt. Washington, 90; Pike's Peak, 66; Salt Lake City, 41; Santa Fe, 48; Winnemucca, 39.

WINDS.

In General.—The prevailing winds at Signal Service stations, are shown by the arrows on Chart No. II, from which it will be seen that they have been southeasterly west of the Lower Mississippi; northerly in the Northwest and Upper Lake region; southerly in the Lower Lake region and Middle States; and northerly in New England, the South Atlantic and East Gulf States.

Total Movements.—The largest total movements for the month, have been, as follows: Barnegat, 10,208 miles; Cape Henry, 10,356; Cape Lookout, 10,814. Cape May, 12,212; Dodge City, 10,078; Indianola,

10,181; Pike's Peak, 13,658; Sandy Hook, 11,302; Sandusky, 10,484. The smallest movements have been, as follows: Augusta, 2,734 miles; Boise City, 1,942; Knoxville, 2,346; Lynchburg, 2,065; Nashville, 1,971; Visalia, 1,833.

Highest Velocities, in miles per hour, have been as follows: Barnegat, E., 60, 21st; Cape Henry, NW., 58, 4th; Cape Lookout, SE., 54, 4th; Cape May, NW., 68, 4th; Dodge City, NE., 60, 3rd; Fort Gibson, S., 50, 14th; Fort Whipple, SE., 60, 4th; Indianola, NE., 96, 16th; Mt. Washington, NW., 102, 23rd; North Platte, SE., 60, 2nd; Pike's Peak, W., 65, 26th; Philadelphia, SE., 60, 4th; St. Marks, SE., 65, 3rd; Washington, NW., 55, 4th.

Local Storms, Tornadoes, &c., as distinct from extended storms, have been reported as follows: 3rd, Louisiana, Mo., severe storm of wind and rain. 7th, Mesquite, Texas, at 3 a. m., a local storm lasting nearly one hour, moving toward ESE., 12 miles wide; houses blown down. 13th, Mare Island, Cal., high wind and thunder-storm. 16th, whirlwind in the bay at Wood's Holl. 30th, Farmington, Utah, very high wind.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily weather indications, with the telegraphic reports for each succeeding twenty-four hours, shows a general percentage of omissions of 0.3 per cent., and of verifications of 84.6 per cent. The percentages of verifications for the four elements have been: weather, 91.2; wind direction, 82.4; temperature, 84.8; barometer, 80.1. The percentages of verifications by geographical districts have been: New England, 83.5; Middle Atlantic States, 88.7; South Atlantic States, 86.1; East Gulf States, 89.6; West Gulf States, 83.6; Lower Lake region, 80.8; Upper Lake region, 83.2; Tennessee and Ohio valley, 86.6; Upper Mississippi valley, 83.7; Lower Missouri valley, 80.3. Of the 3,708 predictions that were made, 121, or 3.3 per cent., are considered to have entirely failed; 89, or 2.4 per cent., were one-fourth verified; 555, or 15.0 per cent., were one-half verified; 378, or 10.3 per cent., were three-fourths verified; 2,565, or 69.0 per cent., were wholly verified.

Cautionary Signals.—During the past month 213 Cautionary Signals have been displayed at 47 stations on the coasts of the United States, of which 173, or 81.2 per cent., were reported verified within 100 miles of the station. Thirty-two cases of high winds were reported from these stations, for which signals were displayed too late or not at all.

NAVIGATION

Stages of Water in Rivers.—In the table on Chart No. III, are given the highest and lowest readings on the Signal Service river gauges. It will be seen that the rivers have all been quite low, and the Ohio so low as to impede navigation. The highest stages occurred after the 15th, and up to the close of the month. *Special reports* as follows: Roanoke river, North Carolina, very high on the 6th, 7th and 8th, within 3 feet 9½ inches of the great freshet of 1873. *Muscatine*, Iowa, 31st, river at low-water mark. *Pittsburgh*, river lowest for 30 years. *Keokuk*, river very low; navigation suspended above this point. *Omaha*, the channel of the Missouri has approached the Nebraska shore. *Shreveport*, the upper Red river and tributaries all very high.

TEMPERATURE OF WATER.

In General.—The temperatures of water, as observed in rivers and harbors, are shown on the Chart No. III.

Maximum and Minimum Temperatures.—The highest maxima have been 84° at Galveston and Key West, 83° at Shreveport, 77° at Nashville and 76° at St. Marks and Cairo. The lowest minima have been 44° at Alpena, 45° at Cleveland, Duluth and La Crosse, and 46° at Eastport, Omaha and Yankton.

Ranges of Temperature.—The least ranges have been: 3° at Key West and San Francisco, 4° at Eastport and 5° at Charleston, Jacksonville, Wilmington and St. Paul. The largest have been 25° at Cleveland, 21° at La Crosse and 20° at Alpena, Galveston, Grand Haven, Omaha and St. Louis.

ATMOSPHERIC ELECTRICITY.

Thunder-storms occurred as follows: On the 1st in Iowa, Mich., Mo., Vt., Wis., 2nd, Dakota, Iowa, Kan., Wis., 3rd, Ill., Iowa, Kan., Mich., Mo., Neb., Tex., Wis., 4th, Canada, Wis., 5th, Mass., 7th, Kan., Tex., 8th, Neb., 9th, Ill., Ind., Iowa, Ohio, Wis., 10th, Md., Va., 12th, Ill., Iowa, Neb., Col., Wash. Ty., 13th, Cal., Ill., Iowa, Kan., Mich., Neb., Wis., 14th, Iowa, Mich., Neb., Wis., 15th, Tex., Iowa, Kan., Neb., 16th, Tex., 18th, La., Canada, Ill., Tex., 20th, Ill., Ind., Ky., Md., N. C., Ohio, Pa., W. Va., Mo., Va., 21st, Del., Md., Mass., N. J., Va., Pa., 22nd, Conn., Mass., 24th, Tex., 25th, Iowa, Tex., 26th, Fla., Iowa, Neb., 27th, Iowa, 29th, Canada, Tex., Vt., 30th, La.